Chesapeake and Ohio Canal: Prather's Neck Road Culvert HAER No. MD-72
On Neck Road underneath the C & O Canal and towpath, 108.74
miles from the eastern terminus of the C & O Canal National Park
Big Spring Vicinity
Washington County
Maryland

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PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, DC 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

CHESAPEAKE AND OHIO CANAL: PRATHER'S NECK ROAD CULVERT

HAER No. MD-72

Location:	C & O Canal National Historical Park on Neck Road underneath the C & O Canal and towpath, 108.74 miles from the eastern terminus. Big Spring vicinity, Washington County, Maryland. UTM: 18/246970/4385860 Quad: Hedgesville, West Virginia
Date of Construction:	1835-1840
Builder:	David Lyles
Present Owner:	National Capital Park Region National Park Service
Present Use:	Vehicular traffic underneath former canal and towpath.
Significance:	This structure typifies road culverts which were utilized to cross underneath the canal, towpath and berm bank to farmlands between the river and canal and/or river crossings. Culvert No. 139 (Prather's Neck) provided access to farmlands in the "neck" of land locked between the river and the canal. In form, the culvert embodies "specifications" that were used to construct culverts by the canal company. This culvert has retained its original intention of a vehicular road culvert and is utilized by the park.
Historian:	Mary Kendall Shipe, 1988

The Chesapeake and Ohio Canal dates from 1825 when it was chartered to provide a commercial connection between the eastern market and the trans-Allegheny West by means of the Chesapeake Bay and Ohio River via the Potomac River. The earliest (eastern) portion of the canal operated from 1831 to 1924. The U.S. Government acquired the canal in 1938, and it was given National Register status by the 1970s.[1]

Today, the Chesapeake and Ohio Canal National Historical Park offers an abundance of masonry structures that are valuable historic resources as a collective whole and as individual structures. Masonry predominates the physical appearance of structures in the park and has been referred to as "the glory of the canal."[2] Over 150 of these masonry structures are culverts. Culverts were necessary to the proper functioning of the canal as they facilitated inland drainage to the Potomac River under the canal, berm bank and towpath bank. The C & O Canal Company employed the use of contractors and its own corps of engineers for the construction of culverts. The major building phase for culverts was between 1832 and 1850. The construction of the culverts was based on specifications that outlined measurements, materials and methods which were formulated before canal construction from 1829 to 1832.[3]

A primary aspect of culvert construction involved the use of a timber foundation for the masonry when a rock foundation was not available on the site. Most structures did require a timber foundation. Culverts were formed from two parallel vertical stone walls that were connected by a masonry arch. Stone was considered the best material for an arch, but brick was also utilized. The presence of a keystone on the masonry arches was indicative of a canal-built structure.[4] The bank surrounding the culvert was held in place with a retaining (or face) wall further supplemented by wingwalls. The size of the culvert opening depended on the amount of drainage that was expected to run through the culvert. The masonry composition of the culverts guaranteed solidity and durability and contributed to a lengthy life span for the structures. In contrast to other masonry structures along the canal (aqueducts, lockhouses and portals, for example), culverts were easily

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[1] For further information on C & O Canal history, see Walter Sanderlin, The Great National Project (Baltimore: The Johns Hopkins Press, 1946).

[2] Elizabeth Kytle, Home on the Canal (Cabin John, Md.: Seven Locks Press, 1983), p. 80.

[3] Kytle, p. 64.

[4] Masonry work in the county surrounding the canal (Washington County) that included keystones indicated that a canal mason had constructed it.(Bridges: Our Legacy in Stone, The Washington County Museum of Fine Arts, September 1965, Entry 19.)

constructed and less complicated from an engineering standpoint. Aesthetically, however, culverts were given equal attention as the other masonry structures as evidenced by the architectural treatment of culvert face walls in which stone texture was often varied to add "visual enhancement".[5] Thus, masonry culverts are representative of masonry construction along the canal in general and the thoughts of permanence that lay behind the usage of masonry.

Although the major type of culvert seen on the canal was the culvert used for inland drainage, it was also necessary to construct road culverts. At points along the canal, there were gaps of land between the river and the canal. Generally, this land was under cultivation or used for grazing. A vehicular culvert provided access to these lands for farmers. This use of culvert was allowed as it preserved the embankment and was not too costly.[6] The President of the Canal also ordered the placement of vehicular culverts at places on the river where communication between states (Maryland, Virginia and West Virginia) via the Potomac River was easily made. At a number of locations, ferry boat landings had already been established for the exchange of goods. The order from the canal president called for culverts at these locations that were "made of such breadth and elevation as to admit the passage of horsemen and laden wagons and carriages beneath the canal."[7]

The Prather's Neck Road Culvert (Culvert No. 139)[8] demonstrates the history of canal land acquisition because the existence of flood plains along the river forced the canal placement further away from the river in some places. The arable land at these locations became locked in between the canal and the river creating the need for vehicular culverts.[9] By 1840, two road culverts were located at Prather's Neck (in close proximity to the Four Locks area), a "neck" of acreage which would have been under cultivation during the canal era. At the site of Culvert No. 139, the Chief Engineer had called for

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[5] National Capital Park Region, National Register Nomination: "C & O Canal National Historical Park," August 1979, p. 3.

[6] Harlan Unrau, Historic Structures Report: The Culverts (Denver Service Center: National Park Service, 1976), p. 16.

[7] Unrau, p. 16.

[8] Original documents of the canal specify numbers rather than names in referring to the culverts. (Unrau, p.38, 40-43.)

[9] Unrau, p. 19: "As the canal company proceeded to purchase land for its right-of-way, it often came into conflict with landowners whose holdings between the river and the canal would be isolated by the waterway. In order to persuade these proprietors to sell or to settle an inquisition in court, the company often agreed to accommodate the landowners by providing a road culvert under the canal."

a twelve foot span road culvert.[10] The Canal Commission had accepted the proposal of David Lyles, contractor, for Culvert No. 139 in 1835 which called for completion of the structure by the fall of 1836.[11] One thousand and forty cubic yards of materials were removed from the pit of this culvert in the fall of 1835.[12]

The Prather's Neck Road Culvert is a typical road culvert along the canal in its representation of the specifications for culverts. These specifications included such features as a stone arch design with a keystone, a timber foundation if rock was unavailable and well-cut ringstones. As described in detail in the Classified Structure Field Inventory Report,[13] this road culvert, constructed in the late 1830s, has an opening twelve foot wide. It measures six feet vertically to the arch spring; the arch has a four foot rise. On both sides, the headwall rises six feet above the arch. The face wall extends three to four feet beyond each side of the opening and spreads out fourteen feet at a sixty degree angle as wingwalls which are stepped in equal increments at a height of eight feet. The culvert runs a length of approximately 113 feet. Today, the Prather's Neck Road culvert serves as an access road to park facilities on Prather's Neck such as camping sites and picnic tables. Hence, it has retained its original function and is thus one of the few remaining canal road culverts still in use.

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[10] Unrau, p. 38.

[11] Ibid.

[12] Ibid., p.40.

[13] This description is heavily based on the detailed description in the Classified Structure Field Inventory Report, Structure No. 48-03. (National Capital Park Region, Classified Structure Field Inventory Reports: C & O Canal [Washington, D.C.: National Park Service, 1976]).

Supplementary Materials (taken from Unrau, Appendix A):

"Specifications for Culverts on the Chesapeake and Ohio Canal"
(ca. 1829)

The Culverts below Harper's Ferry will be about 110 feet long, and those above that point about 100 feet long; but the length will be varied according to circumstances.

The pits and foundations will be excavated of such width and depth as the Superintendent Engineer may direct; and no foundation shall be built upon until he or the Superintendent of Masonry shall inspect and approve it.

When practicable the Culverts will be founded on rock; when this cannot be done, the Engineer may require the foundations of all the walls, as well as the span or water way, to be made firm by paving the same with suitable stone, large and small, well rammed and driven, in which case, the first course of wall on such foundation shall be laid with large flags or stone having broad beds, laid in header form, and bound at the ends. Or foundations of timber may be required by the Engineer, made in the following manner, viz: timbers of suitable size, hewed on two sides, shall be laid one foot apart, and extending under the Culvert and its walls, and to the depth of four feet below the bottom of the aforesaid timbers. These timbers shall be first puddled between and level with their upper surface; and their whole extent shall be floored over with a course of jointed two inch yellow plank, and each plank secured to the timber by at least six locust pins, eight inches long and one and a quarter inches square. On this foundation the walls of the Culvert will be erected.

For all Culverts of four feet span, the arch shall be fourteen inches thick; six feet span, sixteen inches, eight feet span, eighteen inches; twelve feet span, twenty one inches; and sixteen feet span, twenty four inches thick; the space for puddle over the arch generally two and a half feet deep. The arches shall be semi-circular, or the segment of a circular, as may be required. The sheeting stones shall have good parallel pads, and fair joints, dressed with the hammer, and of a proper length to form a good bond. They shall also be of an equal depth, and the extrados of the arch hammered off smooth.

The ring stones shall be well cut and shaped, so as to form joints radiating from the centre. Those for a culvert of four feet span, shall be twelve inches deep; those for six feet span, sixteen inches; those for twelve feet span, eighteen inches; and those for sixteen feet span, twenty inches. They shall form a good bond with the arch, for which purpose, those for a four foot span must run alternately in the arch, from twelve to fifteen inches, and from twenty-four to thirty inches long. For any arch of greater size there must be alternately from fifteen to twenty inches, and from thirty to forty

inches long. The ring stones are to be rusticated one inch, which rustic is to project or be in relief, one inch from the parapets and wings.

The abutments to be of such thickness as will be hereafter directed, to bear a proper proportion to their height, or large stones, well laid in rubble form, except the corners, which must be cut and counted to conform with the ring stones and wings.

The key stones shall be well shaped, hard, and of durable quality, and shall be accurately driven by a wooden mallet before the centres are removed.

The wing walls and parapets to be of hammered range work, to be well bedded and jointed stones, with a due proportion of heads; the whole to be surmounted with a well cut coping, eight inches thick, two feet wide, to project four inches over the face of the wall, unless a water table, is preferred by the Engineer. The whole work to be well laid in cement and grouted, with at least three bushels of cement to the perch. When the case will permit the abutments to be at least two feet high.

When the culvert has been, in other respects, finished, the outer surface of the arch shall be plastered half an inch thick with cement mortar.

The centres shall be constructed in such manner as the Engineer may prescribe.

The cement used must be of the best quality which the upper country will afford, to be approved by the Superintending Engineer, and shall be transported from the mill to the works, and preserved there until used, in such manner as the Engineer may in writing direct. The sand must be clean and sharp, and if not found naturally combining these qualities, it must be washed. No materials shall be used, until they are so approved.

The plan of the masonry, and of its foundation, shall be furnished each Contractor, and if any explanations are necessary, they shall be given by the Engineer of Superintendent of masonry, at all times when required.

Any stone excavated from the culvert pit, if approved by the Engineer, may be used in the construction of the culvert, but the surplus material excavated, shall be deposited at any place the Engineer may direct within the distance of 120 feet from the pit.

Where stone may be required for the construction of the Culvert, and the Contractor cannot agree with owner thereof for the same on reasonable terms, the President and Directors will upon application, cause the same to be condemned according to the Charter of the Company, the contractor paying the expense of the condemnation, as well as the sum awarded by Jury, for the stone.

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